



Environmental Conservation Activities

3R Efforts in Business Activities

The environmental impacts of production plants and offices include the consumption of resources and the emission of waste. To reduce these environmental impacts, we pursue 3R (Reduce, Reuse, Recycle) activities. The production plants are pursuing zero waste emission activities to

minimize the processing of waste in landfills by promoting the control of waste generation and recycling, and they are also working to use water resources efficiently. Our offices are also actively working on reducing mainly copying paper.

Reduction and Appropriate Processing of Waste

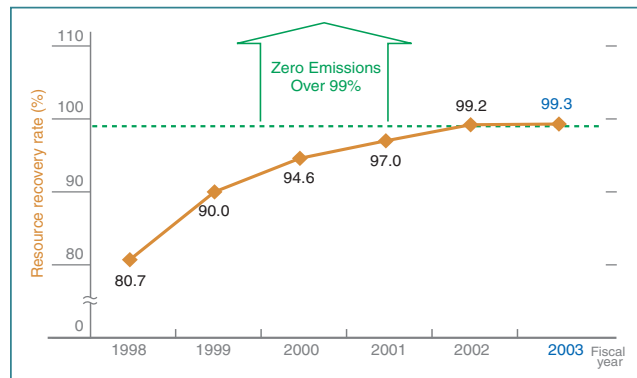
Recycling Achievements (Zero Emissions)

Oki Electric's waste reduction activities have been pursued by the group as a whole since the first establishment of a goal for waste reduction in 1993. In fiscal 1996, we created the Second Waste Reduction Plan, and in fiscal 1999, the resource recovery rate*1) had improved to 90% (average of all sites). In fiscal 2000, we started zero-emission efforts*2) in our major production plants. With the Waste Reduction Promotion WG at the center of the activities, we aimed to share know-how on common examples—such as the recycling of wastepaper— between the sites, and for issues specific to production plants, such as the treatment of industrial waste, the plants proceeded with individual activities. The result was that all major production sites of the Oki group in Japan achieved zero emissions in fiscal 2002, two years ahead of the plan. In fiscal 2003, we focused on efforts at group companies in addition to continuing the efforts from before.

*1) Resource recovery rate: Quantity of recovered resources / (quantity of recovered resources + finally processed waste) x 100

*2) Zero emission: The Oki group defines this as a resource recovery rate of more than 99% for normal waste and industrial waste.

Transition of the Resource Recovery Rate (Major Production Sites of the Oki Group)



Sites that Achieved Zero Emissions

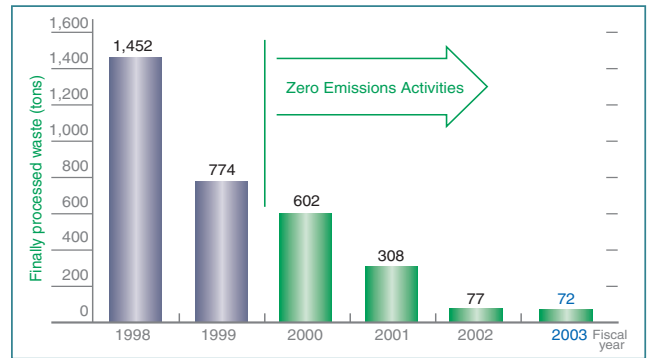
Fiscal Year of Achievement	Site
Fiscal 2001	Miyazaki Oki Electric Co., Ltd.
	Nagano Oki Electric Co., Ltd.
	Honjo district
	Miyagi Oki Electric Co., Ltd.
	Oki Data Corporation (Fukushima district)
Fiscal 2002	Hachioji district
	Takasaki district
	Tomioka district
	Numazu district



Results for Finally Processed Waste

The quantity of finally processed waste stemming from the industrial waste emitted from production plants, and normal waste emitted from offices, etc. was 72 tons in fiscal 2003. This is a 6.5% reduction compared to 2002. Compared to fiscal 1995, this is a 95% reduction.

Transition of Finally Processed Waste Quantities (Major Production Sites of the Oki Group)



Efforts for Resource Recovery of Office Waste

Effective Use of Leftover Food through Raw Garbage Processors

Miyazaki Oki Electric Co., Ltd, a site for semiconductor manufacturing, had been giving an average of 2,000 kg (including water) of leftover food from the canteen to a waste processor every month for incineration. In September 2003, they installed raw garbage processors and started treating leftover food by themselves. In these processors, leftover food is mixed with Uchishiro -bacteria*3) and rice bran. Through high-temperature fermentation, decomposition and drying, the food is turned into soil conditioner. The soil conditioner generated here is distributed to employees, etc. for effective use of resources.

*3) Uchishiro-bacteria: a type of heat-resistant bacteria that is under new spotlight because it is very powerful in recycling raw garbage.





Environmental Conservation Activities

Efforts for Resource Recovery of Waste at Semiconductor Production Plants

Semiconductor plants emit large quantities of waste oil, waste acid, waste alkali and sludge. They work to suppress the generation, regenerate or recover the resources for this kind of waste. They also strive to reduce waste by, for example, introducing a recycling system for surface active agents, or upgrading the sludge dehydration equipment.

Semiconductor Plants: Examples for Resource Recovery of Waste

Waste Category	Type of Waste	Usage of Recovered Resources
Waste oil	Acetone	Recycling and reuse or conversion into fuel
	Ethanol	Recycling and reuse or conversion into fuel
	Isopropyl alcohol	Conversion into fuel
Waste acids	Sulfuric acid	Recycling and reuse
	Phosphoric acids	Conversion into raw material for fertilizers
	Etching fluid	Recovery of molten metal
Waste alkalis	Developer	Conversion into auxiliary fuel
	Developer	Conversion into fuel
Sludge	Inorganic sludge	Conversion into raw material for cement
	Organic sludge	Conversion into raw material for fertilizers

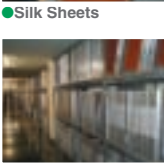
Efforts for Waste Reduction at Production Plants of Electronic Circuit Boards

Reduction of Silk Sheets/Film and Ink through the Installation of Direct Silk Equipment

Oki Printed Circuits Co., Ltd., a group company that designs and manufactures electronic circuit boards, introduced direct silk equipment for the silk printing process, where parts numbers, etc. are printed onto the board. Conventional silk printing equipment prints by applying ink on top of a silk sheet, which generates wasted ink due to printing errors, which happen when too much ink may be applied and because advanced technology is required for the setup. Direct silk equipment blows ink directly onto the board based on data, which improves precision and eliminates the need of sheet management or expert technology. The equipment proved very effective from both quality and environment aspects. The huge number of silk sheets and the film needed to produce the sheets become unnecessary, so that waste could significantly be reduced. Thanks to the effective use of ink and the improved print quality, we were also able to reduce the quantity of ink used.



Old Silk Printing Equipment



Silk Sheets



Huge Quantities of Silk Sheets (Warehouse)



The Newly Introduced Direct Silk Equipment

Efficient Use of Water Resources

In fiscal 2003, the use of water was at 5,321 thousand tons, which is a slight increase of 6% compared to fiscal 2002. To reduce the use of water, we are aggressively promoting the recycling of water within our production plants. Especially the semiconductor manufacturing process uses large quantities of water, so that we have been operating closed purified water systems since the plants were built. The recovery rate of water has reached a level of more than 95%. Other efforts include the reuse of water with the introduction of freshwater treatment equipment for waste fluids of wafer cutting water.

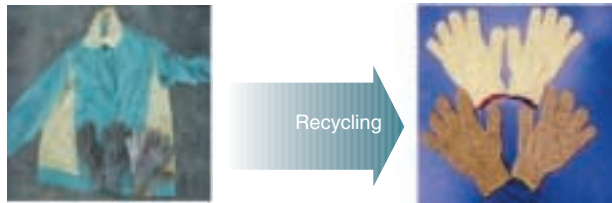


Water Reuse with the Introduction of Freshwater Treatment Equipment for Waste Fluids of Wafer Cutting Water (Example from Fiscal 1998)

Efforts for Waste Recycling at Device Assembly Plants

Recycling of Work Suits and Gloves

Unwanted work suits and gloves from the assembly plants are recycled into gloves. The used items are given to a laundry company, then passed on to another company for they are cut, returned into fiber and then into yarn. The recycled gloves are then returned to the original site.



Examples for Other Efforts

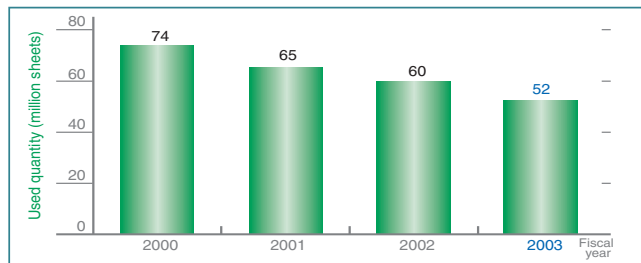
The following are examples of other efforts we worked on up to now. Introduction of equipment to reduce the volume of waste plastic

- ◆ Introduction of equipment to compress polystyrene foam
- ◆ Conversion of PVC into fuel
- ◆ Recycling of cases for electronic parts
- ◆ Simplification of packaging material for delivered materials
- ◆ Revision of waste plastic separation methods
- ◆ Thorough separation through JIT
- ◆ Recycling of soldering board chaff
- ◆ Making solder with a longer life
- ◆ Reuse of packaging and cushioning material

"Less Paper" Activities at Offices

The offices (clerical sections) are working to protect forest resources by green purchasing of office articles, or activities to reduce copying paper. In particular, they try to reduce the quantity of paper for copies, using duplex printing, printing on the reverse side of paper as much as they can, or using networks, such as by changing to electronic approvals of documents, or EDI (electronic data interchange) with business partners. This resulted in a 13% (8 million pages) reduction of paper used compared to the previous year. For copying paper, catalogs/pamphlets, business cards, toilet paper, etc., for in-house use, we further conduct green purchasing in the whole Oki group, and use recycled paper with a high content of recycled material.

Transition in the Use of Copying Paper (Converted into A4-size Pages)



Transition in Water Use

